



INDIANA DEPARTMENT OF TRANSPORTATION

STANDARDS COMMITTEE MEETING

Driving Indiana's Economic Growth

APPROVED MINUTES

September 25, 2008

MEMORANDUM

TO: Standards Committee

FROM: Mike Milligan, Secretary

RE: Minutes for the August 21, 2008 Standards Committee Meeting

The Standards Committee meeting was called to order by the Chairman at 9:06 a.m. on August 21, 2008 in the N755 Bay Window Conference Room. The meeting was adjourned at 11:42 a.m.

The following members were in attendance:

Mark Miller, Chairman
Dennis Kuchler, Constr. Mgmt.
Ron Heustis, Constr. Mgmt.
Larry Rust, Traffic Control
Ron Walker, Materials Mgmt.
Tom Caplinger, Crawfordsville Dist.

Dave Andrews, Pvmt. Engineering
Bob Cales, Contract Admin.
John Wright, Roadway Services
Anne Rearick, Structural Services
Jim Keefer, Fort Wayne Dist.

Also in attendance were the following:

Mike Milligan, Secretary
Jim Reilman, INDOT
Tony Uremovich, INDOT
Steve Fisher, INDOT
Ting Nahrwold, INDOT

Charles Bersch, Seymour Dist.
Shakeel Baig, Crawfordsville Dist.
Tom Duncan, FHWA
Chad Clark, Irving Materials, Inc.
Paul Berebitsky, ICA

Page No.

A. GENERAL BUSINESS ITEMS

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

1. Approval of July 17, 2008 Minutes

The minutes were approved as submitted.

Motion: Mr. Cales

Second: Mr. Andrews

Ayes: 10

Nays: 0

2. Mr. Miller distributed a list to Committee members of specification sub-committees, other committees, and work groups that may provide expertise in reviewing material for the Standards Committee. The lists contained members of the individual committees. Mr. Milligan asked that Committee members review the material and report any concerns or discrepancies to the specific committee chair and to Mr. Milligan, Standards Committee Secretary.
3. Mr. Miller advised the Committee that since the July Standards Committee meeting, there has been significant discussion of asphalt price adjustments. The Commissioner has assigned Mr. Miller to do an in-depth study of asphalt price adjustments and the planned special provision with price indexing will not be enacted until a later date.

B. CONCEPTUAL PROPOSAL ITEMS

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

- ## 1. Breakaway Delineator

ACTION: The Committee recommended that Ms. Nahrwold consider adding all types of delineator posts to an approved list process, including the plastic delineator posts.

C. RECURRING SPECIAL PROVISIONS PROPOSED ITEMS

Item 08-12-1	Mr. Walker	7
213-R-446	FLOWABLE BACKFILL	
Action:	Passed as revised	

D. STANDARD SPECIFICATIONS AND STANDARD DRAWINGS PROPOSED ITEMS

OLD BUSINESS

Item 16-6	Ms. Rearick	13
Policy Change	Semi-Integral End Bents	
Action:	Passed as submitted	

Item 16-7	Ms. Rearick	15
Design Manual	Figures 67-1C(1) Pages 1-4	
	Figures 67-1C(2) Pages 1-2	
	Figure 67-1C(3)	
Action:	Passed as revised	

Item 16-8	Ms. Rearick	23
702.03	Materials	
Action:	Passed as revised	
Item 16-9	Ms. Rearick	24
702.22(c)	Curing-Sealing Materials	
Action:	Passed as revised	
Item 16-10	Ms. Rearick	25
702.27	Method of Measurement	
Action:	Withdrawn	
Item 16-11	Ms. Rearick	26
702.28	Basis of Payment	
Action:	Passed as revised	
Item 16-18	Ms. Rearick	27
906.02(a)5	<i>Polychloroprene Sheeting</i>	
Action:	Passed as revised	
Item 16-20	Ms. Rearick	29
906.08	<i>High Density Plastic Bearing Strips</i>	
Action:	Passed as revised	

NEW BUSINESS

Item 08-12-2	Mr. Heustis	31
503.02	Materials	
503.08	Basis of Payment	
Action:	Passed as revised	
Item 08-12-3	Mr. Heustis	32
506.02	Materials	
506.13	Basis of Payment	
Action:	Passed as revised	
Item 08-12-4	Mr. Heustis	33
507.02	Materials	
507.10	Basis of Payment	
Action:	Passed as revised	
Item 08-12-5	Mr. Heustis	34
703	REINFORCING BARS	
Action:	Passed as revised	
Item 08-12-6	Mr. Heustis	41
707	PRECAST AND <i>PRECAST</i> PRESTRESSED CONCRETE STRUCTURAL MEMBERS	
Action:	Withdrawn	
Item 08-12-7	Mr. Heustis	56
910.01(a)	General	
910.01(b)2	Threaded Tie Bar Assembly	
910.01(b)7	Uncoated 7 Wire Strand for Prestressed Concrete	
910.01(b)9	Epoxy Coated Reinforcing Bars	
Action:	Withdrawn	

cc: Committee Members (11)
FHWA (1)

CONCEPTUAL PROPOSAL ITEM

1. BREAKAWAY DELINEATOR

CONCEPTUAL
PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: New product- Safety Smart (Breakaway) Delineator was introduced to INDOT. It appeared to be a durable, flexible, and easily installed and repaired product after a one year field test in the LaPorte District. Since the breakaway delineator post is not covered by INDOT specifications, the Safety Smart Delineator cannot be approved for use on the Indiana Department of Transportation's highway system at this time.

PROPOSED SOLUTION: It is recommended that specification 926 be revised as shown in the attachment.

{The spec that would be developed would be generic and not specific to the brand noted above. Some reformatting of the section may be necessary to accomplish the addition. LKR}

APPLICABLE STANDARD SPECIFICATIONS: SECTION 926, 804

APPLICABLE STANDARD DRAWINGS: 802-SNGS-07

APPLICABLE DESIGN MANUAL SECTION: 76-4.02

APPLICABLE SECTION OF GIFE: N/A

APPLICABLE RECURRING SPECIAL PROVISIONS: N/A

Submitted By: Larry K. Rust for Ting Nahrwold, P.E.

Title: Traffic Evaluation Engineer

Organization: Office of Traffic Engineering

Phone Number: 232-5549

Date: July 18, 2008

APPLICABLE SUB-COMMITTEE ENDORSEMENT?



PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Recurring Special Provision 213-R-446 for Flowable Backfill requires that the lightweight dynamic cone penetration test and the Removability Modulus be used to determine if the flowable backfill is removable. The requirement for the lightweight dynamic cone penetration test is that the average penetration resistance blow count number shall not be less than 20 nor greater than 30 after the flowable backfill has cured for three days. Initial trial batch demonstrations have indicated that the resistance blow count of 20 is not correct and that this number should be lowered to 12 blows. Also, the use of Darafill®, Darafill® Dry, or equal should be allowed to be used in the removable flowable backfill to increase the air content and flow consistency of the material.

PROPOSED SOLUTION: Revise Recurring Special Provision 213-R-446 to change the requirement for the lightweight dynamic cone penetration blow count number for removable backfill from not less than 20 nor greater than 30 to not less than 12 nor greater than 30. Also, allow Darafill®, Darafill® Dry, or equal to be used for removable flowable backfill.

APPLICABLE STANDARD SPECIFICATIONS: None

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: None

APPLICABLE RECURRING SPECIAL PROVISIONS: 213-R-446

Submitted By: Ron Walker

Title: Manager, Office of Materials Management

Organization: INDOT

Phone Number: 317-610-7251 x 204

Date: 07-31-08

APPLICABLE SUB-COMMITTEE ENDORSEMENT? These specification revisions are recommended by the INDOT/IRMCA Technical Committee, Research Division, and District Testing Engineers.

REVISION TO RECURRING SPECIAL PROVISION

11-01-08

213-R-446 FLOWABLE BACKFILL

(Revised 08-21-08)

The Standard Specifications are revised as follows:

SECTION 213, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 213 – FLOWABLE BACKFILL

213.01 Description

This work shall consist of placing flowable backfill in trenches for pipe structures, culverts, utility cuts, and other work extending under pavement locations, to fill cavities beneath slopewalls and other locations in accordance with 105.03.

Flowable backfill will be classified as either removable or non-removable.

MATERIALS

213.02 Materials

Materials shall be in accordance with the following:

Concrete Admixtures*	912.03
Fine Aggregate*	904.02(a)
Fly Ash	901.02
Portland Cement	901.01(b)
Water	913.01

*Except that steel furnace slag shall not be used

*Other admixtures that increase flowability may be used as approved by the Engineer.

~~Darafill ®, Darafill ® Dry, or equal may be used in removable flowable backfill.~~

~~If fly ash is used as a filler and not as a pozzolan, the fly ash shall be in accordance with 904.~~

The supplier may elect to use *nominal size No. 23 and No. 24* gradations in accordance with 904.02(h) or may propose the use of alternate gradations. The alternate gradation and proposed tolerances of material passing each sieve shall be included in the flowable backfill mix design.

213.03 Flowable Backfill Mix Design

The Contractor shall submit a flowable backfill mix design, FBMD, to the Engineer DMTE a minimum of seven days and arrange a prior to the trial batch. The FBMD will be approved based on compliance accepted in accordance with 213.04. The FBMD shall be submitted in a format acceptable to the Engineer DMTE and shall include the following:

- (a) a list of all ingredients

- (b) the source of all materials
- (c) the gradation of the aggregates
- (d) the batch weight (mass) *with the aggregates at the SSD condition*
- (e) the names of all admixtures
- (f) the admixture dosage rates and manufacturer's recommended range

~~FBMD's which were used on contracts in the current or previous calendar year, may be submitted to the District Materials and Tests Engineer for approval. Effective January 1, 2004, all FBMD's shall meet the requirements of 213.05. A FBMD in accordance with these specifications, which has been approved for use on a previous contract, may be submitted to the DMTE for approval. The submittal shall include copies of test results in accordance with 213.04 and 213.05.~~

~~After the completion of the trial batch and all test results have been reviewed for compliance with the specifications, a mixture number will be assigned by the Engineer.~~

~~Mix design changes—Changes in the FBMD will not be allowed after the FBMD approval, except for adjustments to compensate for routine moisture fluctuations or a change in sand source in accordance with 213.05 based on the dry flow determined from the trial batch testing. All other changes will require a new FBMD.~~

213.04 Flowable Backfill Mix Criteria

The FBMD shall produce a workable mixture with the following properties.

Minimum Unconfined Compressive Strength	
at 28 days.....	50 psi (350 kPa)
Maximum Unconfined Compressive Strength	
at 28 days.....	150 psi (1050 kPa)
Minimum Fill Spread Diameter	8 in. (200 mm)

(a) Flow Consistency

Flow consistency will be measured in accordance with ASTM D 6103. The diameter of the spread shall be at least 8 in. (200 mm).

(b) Lightweight Dynamic Cone Penetration Blow Count Number

A lightweight dynamic cone penetration test will be performed in accordance with ITM 216 after the flowable backfill mix has cured for three days. The average penetration resistance blow count number for removable flowable backfill shall not be less than 12 nor greater than 30. Non removable flowable backfill mixes shall have an average penetration resistance blow count greater than 30.

(c) Removability Modulus

The removability modulus, RM, will be determined for the FBMD by the formula as follows:

$$RM = 0.000104(U_w)^{1.5} \sqrt{1.72N_{14} - 15.64} \quad (\text{English Units})$$

$$(RM = 0.00000162(U_w)^{1.5} \sqrt{1.72N_{14} - 15.64}) \quad (\text{SI Units})$$

where:

N_{14} = average lightweight dynamic cone penetration blow count after 14 days in accordance with ITM 216.

U_w = dry unit weight, pcf (kg/m^3), of flowable backfill after 14 days in accordance with ITM 218.

The RM shall be 1.0 or less for removable flowable backfill.

After all test results have been reviewed for compliance with the specifications, a mixture number will be assigned by the DMTE.

213.05 Flowable Backfill Trial Batch

A trial batch shall be produced by the Contractor and will be tested by the District Materials and Tests Engineer Department to verify that the FBMD meets the flowable backfill mix criteria. The Department will verify the classification of the mix as either removable or non-removable from the results of the trial batch. The flowable backfill shall be batched within the proportioning tolerances of 508.02(b). The Engineer Department will determine the test results and provide them to the Contractor with test results for the unconfined compressive strength test and the flowable backfill spread diameter. The trial batch shall be of sufficient quantity to allow the Contractor and the Engineer Department to perform all required tests from the same batch. Trial batch flowable backfill shall not be used for more than one test.

Compressive strength testing shall be conducted in accordance with ITM 588. Flow testing shall be conducted in accordance with ASTM D 6103.

The Contractor shall determine the penetration resistance of the flowable backfill produced during the trial batch in accordance with ITM 213 at one, three, seven, and fourteen days. The results shall be submitted to the Engineer.

FBMD's which were used on contracts in the current or previous calendar year, may be submitted to the District Materials and Tests Engineer for approval.

The Department will obtain a sample of the fine aggregate and fly ash described in the FBMD. The Department will test the dry flow in accordance with ITM 217 and record the results on the FBMD.

If the Contractor requests to change the source of the fine aggregate identified in an approved FBMD the Contractor shall submit a revised FBMD to the DMTE. The Department will obtain a sample of the new fine aggregate and, if applicable, a sample of the fly ash as identified in the approved FBMD. Dry flow will be tested in accordance with ITM 217. If the test result is within ± 2.0 s of the value shown on the approved FBMD, the revised FBMD will be approved and a new trial batch will not be required. Failure to meet the dry flow test requirement will require the Contractor to submit a new FBMD and perform a new trial batch for approval of the proposed new fine aggregate.

213.06 Mixing Equipment

The mixing equipment shall be in accordance with the applicable requirements of 702 or 722, except that in lieu of the calibration requirements of 722.11, the mixer operator shall make delivery in a properly calibrated continuous mixer.

CONSTRUCTION REQUIREMENTS

213.07 Placement

The flowable backfill shall not be placed on frozen ground. Flowable backfill shall be protected from freezing ~~until the material has set for 72 hr.~~ Flowable backfill shall not be placed into or through standing water unless approved by the Engineer in writing.

The diameter of the flowable backfill spread shall be at least 8 in. (200 mm) at time of placement. *Water may be adjusted from the FBMD to meet the minimum spread requirement if the initial measured spread is between 7 and 8 in. (175 and 200 mm).*

If using mixing equipment in accordance with 722, the yield will be checked using the 1/4 cu yd (0.2 m³) box method as follows:

- (a) The chute shall be cleaned and the box shall be positioned on a level surface to receive the discharged flowable backfill.*
- (b) The mixer shall be operated until the cement or fly ash counter indicates that 1/4 cu yd (0.2 m³) of flowable backfill has been yielded.*
- (c) The contents of the box will be consolidated and struck off. If the box is not full, the gates shall be adjusted and the procedure shall be repeated until the actual and calculated volumes of flowable backfill agree.*
- (d) Yield will be checked on the first load of each truck and every third load per truck thereafter. Additional yield tests will be required after making any adjustments.*

The flowable backfill shall be brought up uniformly to the fill line as shown on the plans or as directed. *When used as structure backfill, flowable backfill shall be placed uniformly so as not to induce unbalanced loading on any part of a structure.*

The flowable backfill shall not be subjected to load nor disturbed by construction activities until *a lightweight dynamic cone penetration test has produced a minimum blow count* ~~resistance testing in accordance with ITM 213 has been completed.~~ The minimum ~~penetration resistance blow count~~ shall be as follows:

For PCCP70 psi (500 kPa)
For all Other Applications..... 1200 psi (8000 kPa)

Construction Activities With Vibratory Compaction After Backfill.....12
Construction Activities Without Vibratory Compaction After Backfill.....7

213.08 Method of Measurement

Flowable backfill will be measured by the cubic yard (cubic meter) *of the type specified* as computed from the neat line limits shown on the plans, or as adjusted. If neat line limits are not shown on the plans, the volume in cubic yards (cubic meters) of flowable backfill furnished and placed will be computed from the nominal volume of each batch and a count of the batches. Unused and wasted flowable backfill will be estimated and deducted. Drilled holes will be measured by the number of holes drilled.

REVISION TO RECURRING SPECIAL PROVISION

213-R-446 FLOWABLE BACKFILL, CONTINUED.

213.09 Basis of Payment

The accepted quantities of flowable backfill will be paid for at the contract unit price per cubic yard (cubic meter) *for the type specified*, furnished and placed. Holes drilled in the pavement will be paid for at the contract unit price per each.

Payment will be made under:

Pay Item**Pay Unit Symbol**

Drilled Hole for Flowable Backfill	EACH
Flowable Backfill, <i>Non-Removable</i>	CYS (m3)
<i>Flowable Backfill, Removable</i>	CYS (m3)

The cost of material placed outside the neat line limits, material placed outside the adjusted limits, and unused or wasted flowable backfill shall be included in the cost of this work.

COMMITTEE COMMENTS: The Committee discussed concern over use of specific product names in the specifications. The Specification was revised to avoid use of specific product names.

Other sections containing
specific cross references:

None

General Instructions to Field Employees
Update Required? No

Frequency Manual
Update Required? No

Recurring Special Provisions
potentially affected:

213-R-446

Standard Sheets potentially affected:

None

Motion: Mr. Walker
Second: Mr. Kuchler
Ayes: 10
Nays: 0

Action: Passed as revised

☒ RSP Effective: December 2008 Letting
RSP Sunset Date: _____
☐ RPD Effective: _____ Letting
☒ 2010 Standard Specifications Book
☐ 20__ Standards Edition
☐ Technical Advisory

Received FHWA Approval? Yes

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: We do not have standardized details for semi-integral end bents similar to integral end bents. Integral end bents are not feasible for bridges on a greater skew than 30 deg, or that have an expansion length of greater than 250 ft.

PROPOSED SOLUTION: Include standard semi-integral end bent details in the Design Manual. This concept is Old Business. It was withdrawn from a vote in the Nov. 2006 Standards Committee meeting.

APPLICABLE STANDARD SPECIFICATIONS: 702.03, 702.22(c), 702.27, 702.28, 906.02(a)5, 906.08

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: 67-1.01

APPLICABLE SECTION OF GIFE: None

Submitted By: Anne Rearick

Title: Manager, Office of Structural Services

Organization: INDOT

Phone Number: 2-5152

Date: 7-29-08

POLICY CHANGE

Semi-Integral End Bents

Revises Indiana Design Manual Section 67-1.01

Other sections containing
specific cross references:

None

Recurring Special Provisions
potentially affected:

None

Motion: Ms. Rearick

Second: Mr. Walker

Ayes: 10

Nays: 0

General Instructions to Field Employees
Update Required? NoFrequency Manual
Update Required? No

Standard Sheets potentially affected:

None

Action: Passed as submitted

☐ RSP Effective: _____ Letting

RSP Sunset Date: _____

☐ RPD Effective: _____ Letting☐ 20__ Standard Specifications Book☐ 20__ Standards Edition☒ Technical Advisory

Withdrawn _____

Received FHWA Approval? Yes



INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

Design Memorandum No. 08-____ Policy Change

July 29, 2008 DRAFT

TO: All Design, Operations, and District Personnel, and
Consultants

FROM: _____
Anthony L. Uremovich
Design Resources Engineer
Production Management Division

SUBJECT: Semi-Integral End Bents

REVISES: *Indiana Design Manual* Section 67-1.01

EFFECTIVE: _____, 2008, Letting

Semi-integral end bents should be considered for each bridge for which integral end bents are not practical or feasible. For a skew angle of greater than 30 deg, or an expansion length of 250 ft (80 m) or longer, twisting or racking of the bridge should be investigated.

Indiana Design Manual Figure 67-1C(1) shows details for Method 1, Figure 67-1C(2) shows details for Method 2, and Figure 67-1C(3) shows details for the joint-protection sheeting. All figures are attached hereto. All applicable information shown in the figures should be shown on the plans.

Recurring Special Provision 702-B-____, also attached hereto, regarding the joint-protection sheeting and high-density plastic bearing strips, should be called for beginning with the _____, 2008, letting, and through the August 12, 2009, letting. Beginning with the September 10, 2009, letting, the recurring special provision will be incorporated into the *INDOT Standard Specifications*. The provision will then no longer be required to be called for in specific contracts.

alu
Attachments

[P:\Structural Services\Design Memos\08SIEB-pc.doc]

REVISION TO DESIGN MANUAL

FIGURES 67-1C(1) Suggested Semi-Integral End Bent Details (Method 1)

FIGURES 67-1C(2) Suggested Semi-Integral End Bent Details (Method 2)

FIGURE 67-1C(3) Joint Membrane Detail

Other sections containing
specific cross references:

None

Recurring Special Provisions
potentially affected:

None

Motion: Ms. Rearick

Second: Mr. Walker

Ayes: 10

Nays: 0

General Instructions to Field Employees
Update Required? No

Frequency Manual
Update Required? No

Standard Sheets potentially affected:

None

Action: Passed as revised

___ RSP Effective: _____ Letting

RSP Sunset Date: _____

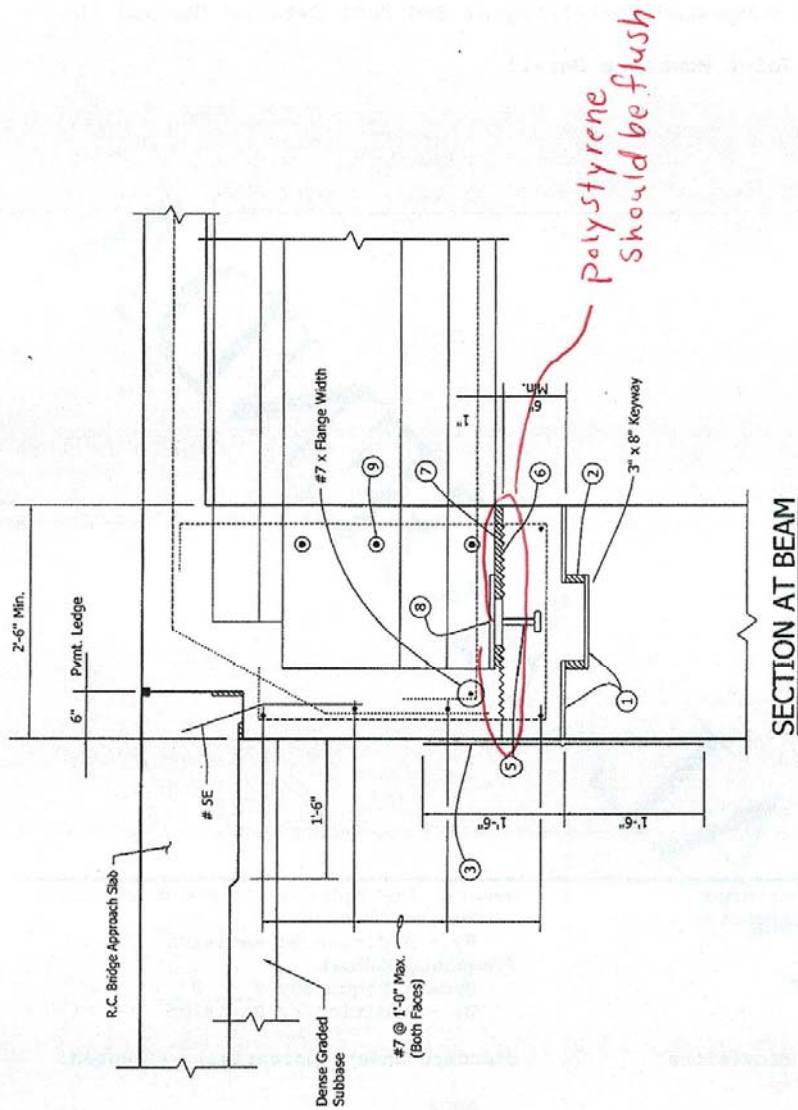
___ RPD Effective: _____ Letting

___ 20__ Standard Specifications Book

___ 20__ Standards Edition

___ Technical Advisory

Received FHWA Approval? Yes

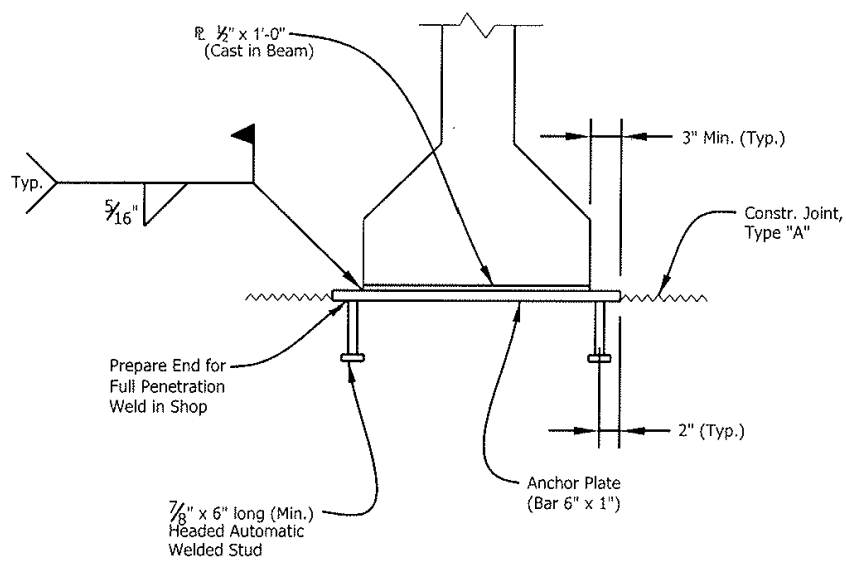


SUGGESTED SEMI-INTEGRAL END BENT DETAILS
(Method 1)

Figure 67-1 C (1)
(Page 1 of 4)



Figure 67-1 C (1)
(Page 2 of 4)



ANCHOR PLATE DETAIL

SUGGESTED SEMI-INTEGRAL END BENT DETAILS (Method 1)

Figure 67-1 C (1)
(Page 3 of 4)

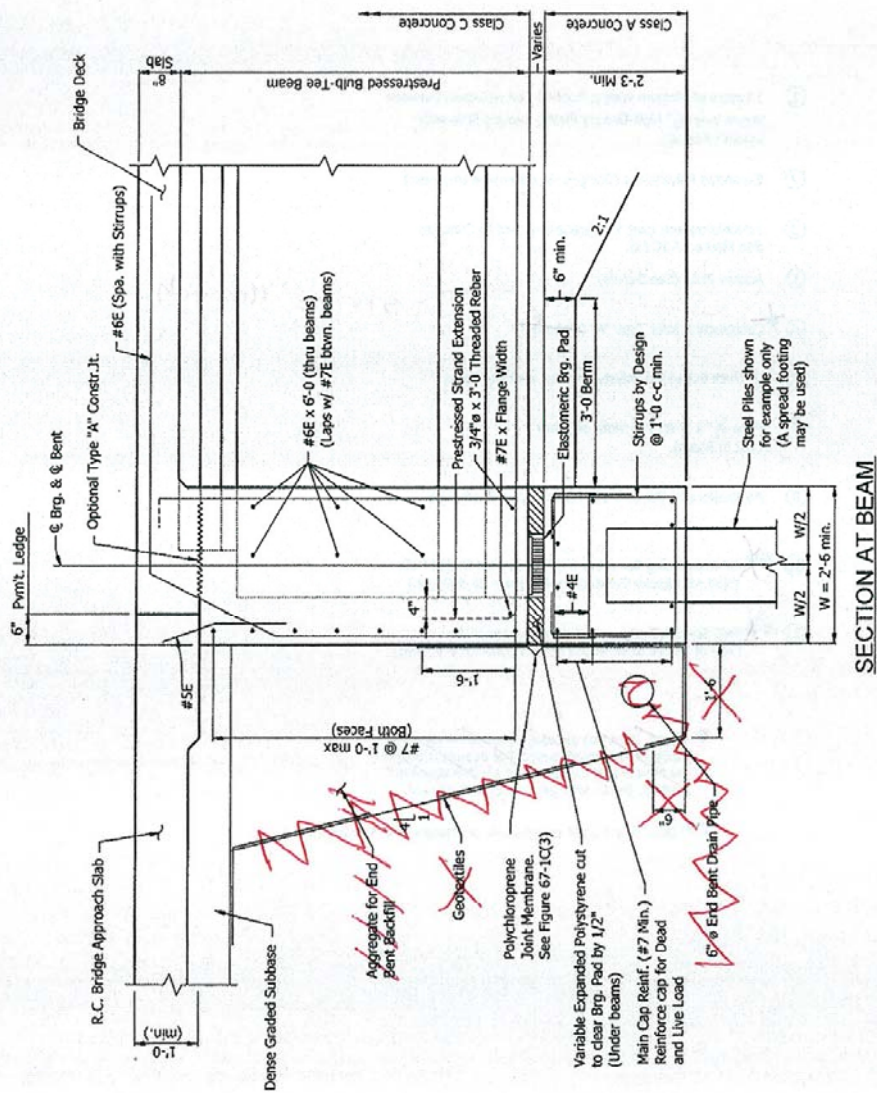
- ① 3 Layers of Medium Weight Roofing Felt w/Grease between layers over $\frac{3}{8}$ " High-Density Plastic Bearing Strip with smooth side up.
- ② Expanded Polystyrene (Designer to determine thickness)
- ③ Polychloroprene Joint Membrane attached to Concrete See Figure 67-1C (3).
- ④ Anchor Plate (See Details)
- ⑤ ~~Construction Joint Type "A" (optional)~~ *stroke through*
- ⑦ 1" Thick Expanded Polystyrene, full width of Beam.
- ⑧ Plate $\frac{1}{2}$ " x 1'-0", full width of Beam (Cast in Beam).
- ⑨ #6 Reinforcing Bar thru 1'-0" Holes cast in Beam Web.
- ⑩ ~~#6 Reinforcing Bar set in 1'-0" Deep Filled Drilled Hole filled with Epoxy Grout. (Min. Pullout = 26,500 Lbs.)~~ *stroke through*
- ⑪ ~~PVC Sleeve (Designer to determine size of Sleeve) (Top of Sleeve to be sealed before Concrete is poured)~~

Comment made
during review
of August minutes
at September 18, 2008
meeting -
Replace
Double asterisk
with single asterisk

- ⑫ ~~Cover Joists may be used, between Wings to facilitate temporary support of Beams. If Beams are temporarily supported by another approved method, this Constr. Joint may be eliminated.~~
- ⑬ ~~Used only if uplift is expected, or if bridge is in Seismic Zone 2.~~

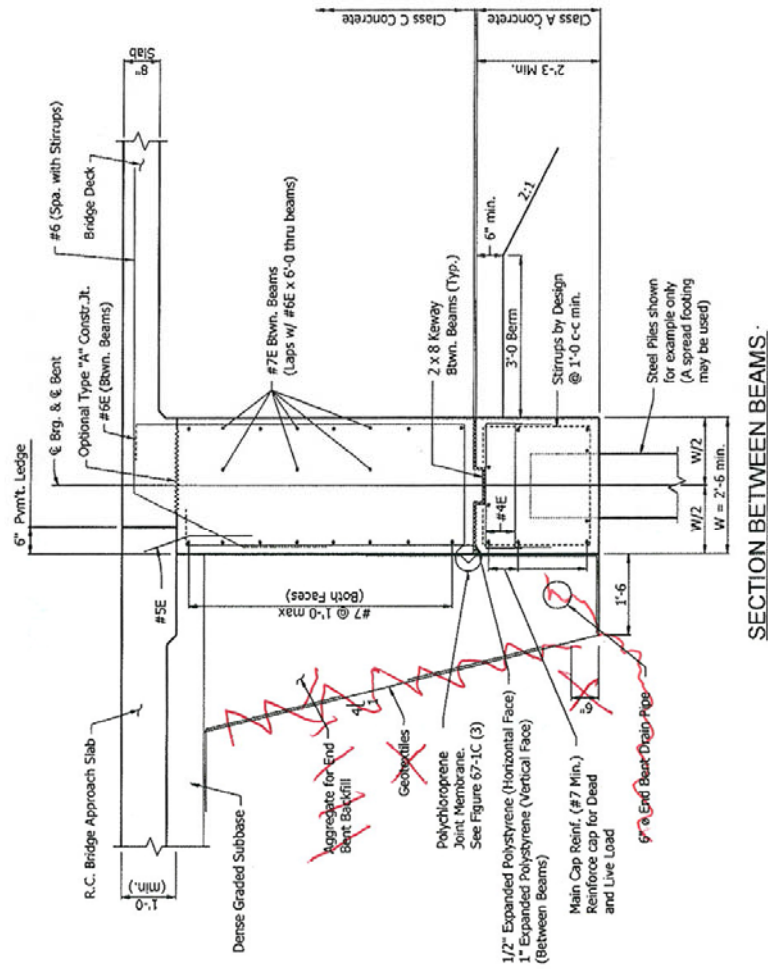
SUGGESTED SEMI-INTEGRAL END BENT DETAILS (Method 1)

Figure 67-1 C (1)
(Page 4 of 4)



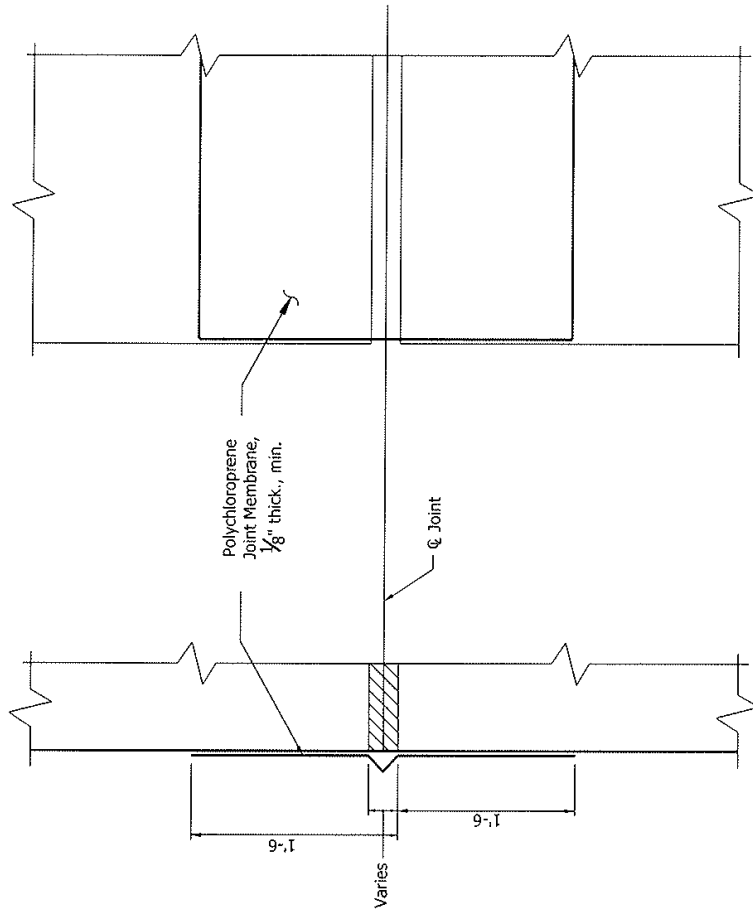
SUGGESTED SEMI-INTEGRAL END BENT DETAILS (Method 2)

Figure 67-1 C (2)
(Page 1 of 2)



SUGGESTED SEMI-INTEGRAL END BENT DETAILS
(Method 2)

Figure 67-1 C (2)
(Page 2 of 2)



JOINT MEMBRANE DETAIL

Figure 67-1 C (3)

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 702 AFTER LINE 43, INSERT AS FOLLOWS:

<i>High Density Plastic Bearing Strips</i>	906.08
Permanent Metal Forms	910.03
<i>Polychloroprene Sheeting and Adhesive</i>	906.02(a)5
Portland Cement	901.01(b)
Steel Drain Pipe	910.07
Utility Asphalt, UA-1	902.01(d)
Water	913.01

Other sections containing
specific cross references:

None

Recurring Special Provisions
potentially affected:

None

Motion: Ms. Rearick
Second: Mr. Walker
Ayes: 10
Nays: 0

General Instructions to Field Employees
Update Required? No

Frequency Manual
Update Required? No

Standard Sheets potentially affected:

None

Action: Passed as revised

☒ RSP Effective: December 2008 Letting
RSP Sunset Date: _____
☐ RPD Effective: _____ Letting
☒ 2010 Standard Specifications Book
20__ Standards Edition
☐ Technical Advisory

Received FHWA Approval? Yes

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 702 AFTER LINE 1270, INSERT AS FOLLOWS:

Polychloroprene used for a semi-integral end bent shall be secured to the concrete with an adhesive. The polychloroprene sheeting shall be ~~vertically installed and centered vertically on the joint, and shall have no laps~~ gaps. Joints in the sheeting material shall be lapped a minimum of 12 in. (300 mm).

Other sections containing
specific cross references:

709.08 Pg 505

Recurring Special Provisions
potentially affected:

None

Motion: Ms. Rearick
Second: Mr. Walker
Ayes: 10
Nays: 0

General Instructions to Field Employees
Update Required? No

Frequency Manual
Update Required? No

Standard Sheets potentially affected:

None

Action: Passed as revised

☒ RSP Effective: December 2008 Letting
RSP Sunset Date: _____
☐ RPD Effective: _____ Letting
☒ 2010 Standard Specifications Book
20__ Standards Edition
☐ Technical Advisory

Received FHWA Approval? Yes

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 702 AFTER LINE 1419, INSERT AS FOLLOWS:

Polychloroprene sheeting and all materials required for installation of the sheeting will not be measured.

High density plastic bearing strips will not be measured.

Other sections containing
specific cross references:

704.07 Pg 484

714.07 Pg 543

717.08 Pg 566

Recurring Special Provisions
potentially affected:

None

Motion: M
Second: M
Ayes:
Nays:

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Withdrawn

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 702 AFTER LINE 1476, INSERT AS FOLLOWS:

The cost of furnishing and installing polychloroprene sheeting shall be included in the cost of concrete, ~~class~~ A, substructure.

The cost of high density plastic bearing strips shall be included in the cost of concrete, ~~class~~ A, substructure.

Other sections containing
specific cross references:

206.11 Pg 175

704.08 Pg 485

714.08 Pg 544

Recurring Special Provisions
potentially affected:

None

Motion: Ms. Rearick

Second: Mr. Walker

Ayes: 10

Nays: 0

General Instructions to Field Employees
Update Required? No

Frequency Manual

Update Required? No

Standard Sheets potentially affected:

None

Action: Passed as revised

☒ RSP Effective: December 2008 Letting

RSP Sunset Date: _____

☐ RPD Effective: _____ Letting

☒ 2010 Standard Specifications Book

☐ 20__ Standards Edition

☐ Technical Advisory

Received FHWA Approval? Yes

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 906 AFTER LINE 100, INSERT AS FOLLOWS:

~~Polychloroprene to be attached to a semi-integral end bent shall be in accordance with ASTM D 3542. The adhesive used to attach the polychloroprene to the end bent concrete shall be a black styrene-butadiene rubber base material compatible with both concrete and polychloroprene. The adhesive shall be in accordance with the following:~~

5. Polychloroprene Sheeting

This material shall consist of general-purpose, heavy-duty polychloroprene sheeting, 3/32 in. (2.5 mm) thickness, with nylon fabric reinforcement. The sheeting shall be in accordance with the following.

TEST DESCRIPTION	TEST METHOD	REQUIREMENT
Thickness	ASTM D 751	0.094 in. \pm 0.01 (2.4 mm \pm 0.2)
Breaking Strength, Grab, minimum	ASTM D 751	700 lb x 700 lb, longit. x transv. (3115 N x 3115 N, longit. x transv.)
Adhesive Strip, 1 in. (25 mm) wide x 2 in. (50 mm) long	ASTM D 751	9 lb (40 N)
Bursting Strength, minimum	ASTM D 751	1400 psi (9650 kPa)
Heat Aging, 70 h, 212 °F (100 °C), 180-deg bend without cracking	ASTM D 2136	No Cracking of Coating
Low-Temp. Brittleness, 1 h, 40 °F (5 °C), bend around 1/4 in. (6 mm) mandrel	ASTM D 2136	No Cracking of Coating

Material furnished under this specification shall be covered by a type B certification in accordance with 916.

The adhesive used to attach polychloroprene sheeting to concrete shall be a black styrene-butadiene rubber base material compatible with both concrete and polychloroprene. The adhesive shall be in accordance with the following.

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 906 CONTINUED.

<i>Property</i>	<i>Test Method</i>	<i>Minimum</i>	<i>Maximum</i>
<i>Viscosity, cps</i>	<i>ASTM D 2196, RVF #6 sp @20 rpm</i>	<i>7500</i>	<i>18000</i>
<i>Solids, %</i>	<i>ASTM D 1259</i>	<i>28</i>	<i>35</i>
<i>Weight per gal., lb (Mass per L, kg)</i>	<i>ASTM D 1875</i>	<i>6.6 (0.79)</i>	<i>7.0 (0.84)</i>

The adhesive shall be covered by a type C certification in accordance with 916.

Other sections containing
specific cross references:

None

Recurring Special Provisions
potentially affected:

None

Motion: Ms. Rearick
Second: Mr. Walker
Ayes: 10
Nays: 0

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as revised

x RSP Effective: December 2008 Letting

RSP Sunset Date: _____

___ RPD Effective: _____ Letting

x 2010 Standard Specifications Book

___ 20__ Standards Edition

___ Technical Advisory

Received FHWA Approval? Yes

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 906 AFTER LINE 299, INSERT AS FOLLOWS:

906.08 High Density Bearing Strip

The strip shall be non-toxic multipolymer plastic in accordance with the following requirements.

<i>PROPERTY</i>	<i>TEST METHOD</i>	<i>REQUIREMENT</i>
<i>Compressive Strength</i>	<i>ASTM D 695</i>	<i>8000 to 9000 psi (55.2 to 62.1 MPa)</i>
<i>Coefficient of Linear Expansion</i>	<i>ASTM D 696</i>	<i>3.0 x 10⁻⁵ in./in./°C to 5.0 x 10⁻⁵ in./in./°C (7.62 x 10⁻⁴ mm/mm/°C to 1.27 x 10⁻³ mm/mm/°C)</i>

Material furnished under this specification shall be covered by a type B certification in accordance with 916.

Other sections containing
specific cross references:

None

Recurring Special Provisions
potentially affected:

None

Motion: Ms. Rearick
Second: Mr. Walker
Ayes: 10
Nays: 0

General Instructions to Field Employees
Update Required? No

Frequency Manual
Update Required? No

Standard Sheets potentially affected:

None

Action: Passed as revised

☒ RSP Effective: December 2008 Letting
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☐ Technical Advisory

Withdrawn _____

Received FHWA Approval? Yes

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: References to protection of epoxy coated reinforcing bars in the SS are vague. The current SS indicate bars shall be handled and stored to as to prevent damage to the bars and coating. It then specifically mentions protective and padded banding, lifting techniques, and storing above the ground. However exposure to sunlight is not mentioned.

When epoxy is exposed to the ultraviolet component of sunlight, it deteriorates over a short period of time. There are several instances in the field where epoxy coated reinforcing bars are exposed to sunlight and the epoxy coating is oxidizing. When the coating oxidizes, it breaks down and a powdery residue is formed on the bars. The coating loses its glossy appearance and turns dull.

Section 15 of ASTM A775, which is referenced in the SS (910.01(b)9) specifically mentions the protections as described above but also specifically mentions protection from sunlight exposure. As exposure to sunlight is just as detrimental to the epoxy coating as the methods with which the bars are handled it should be more prominently made a part of 703 and mentioned along with the other handling, lifting, and storing methods already mentioned. Dowel bars and retrofit tie bars in the 500 section should also be required to be protected. Minor changes are proposed for three 500 sections.

Currently welding of reinforcing bars is permitted in 707. This section has been revised and moved from 707 to 703 to put it in the reinforcing bar section.

Also a minor issue with coated threaded tie bar assemblies and coated couplings has been cleaned up in the 900 section.

PROPOSED SOLUTION: Reword the first two paragraphs of 703.04 to make them clearer. Incorporate language into the specification requiring the Contractor to cover epoxy coated reinforcement during shipping, storage, and prior to concrete placement.

APPLICABLE STANDARD SPECIFICATIONS: 503, 506, 507, 703, 910.01(b)2 & (b)9

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: new GIFE sections 503,506, 507, & 703

APPLICABLE RECURRING SPECIAL PROVISIONS: None

Submitted By: Ron Heustis for Jim Reilman (chairman, 700 subcommittee)

Title: Manager, Construction Technical Support

Organization: INDOT

Phone Number: 317-234-2777

Date: July 24, 2008

APPLICABLE SUB-COMMITTEE ENDORSEMENT? 700 Spec Subcommittee. Also have received endorsement from Industry.

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 503, AFTER LINE 24, INSERT AS FOLLOWS:

The epoxy coating on the dowel bars and bent and straight tie bars shall be protected in accordance with 703.04.

SECTION 503, BEGIN LINE 257, INSERT AS FOLLOWS:

The cost of dowels, dowel bar assemblies, ~~protecting the epoxy coating on the dowels and dowel bar assemblies~~, backer rod, joint sealants and all necessary incidentals shall be included in the cost of D-1 contraction joints.

Other sections containing
specific cross references:

503.08
706.06 Pg 489

Recurring Special Provisions
potentially affected:

None

Motion: Mr. Heustis

Second: Mr. Cales

Ayes: 10

Nays: 0

General Instructions to Field Employees
Update Required? Yes

Frequency Manual
Update Required? No

Standard Sheets potentially affected:

None

Action: Passed as revised

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Received FHWA Approval? Yes

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 506, AFTER LINE 28, INSERT AS FOLLOWS:

The epoxy coating on the dowel bars shall be protected in accordance with 703.04.

SECTION 506, BEGIN LINE 304, INSERT AS FOLLOWS:

The cost of PCCP removal, subbase, and subgrade excavation, when required, subbase and subgrade recompaction, non-vapor barrier bonding agent, dowel bars, ~~protecting the epoxy coating on the dowels and dowel bar assemblies~~, reinforcing bars, chemical anchoring system, concrete, finishing and curing, and sawing and sealing of joints shall be included in the cost of PCCP patching.

Other sections containing
specific cross references:

507.13
507.10 Pg 329

Recurring Special Provisions
potentially affected:

None

Motion: Mr. Heustis
Second: Mr. Cales
Ayes: 10
Nays: 0

General Instructions to Field Employees
Update Required? Yes

Frequency Manual
Update Required? No

Standard Sheets potentially affected:

None

Action: Passed as revised

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Received FHWA Approval? Yes

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 507, AFTER LINE 17, INSERT AS FOLLOWS:

The epoxy coating on the dowel bars shall be protected in accordance with 703.04.

SECTION 507, BEGIN LINE 221, INSERT AS FOLLOWS:

The cost of cutting of slots, cleaning, dowel bars, dowel bar supports, dowel bar end caps, ~~protecting the epoxy coating on the dowels and dowel bar assemblies~~, foam board, mortar, and curing materials shall be included in the cost of the pay item retrofit transfer.

Other sections containing
specific cross references:

507.10
305.07 Pg 215

Recurring Special Provisions
potentially affected:

None

Motion: Mr. Heustis

Second: Mr. Cales

Ayes: 10

Nays: 0

General Instructions to Field Employees
Update Required? Yes

Frequency Manual
Update Required? No

Standard Sheets potentially affected:

None

Action: Passed as revised

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Received FHWA Approval? Yes

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 703 BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 703 – REINFORCING BARS**703.01 Description**

This work shall consist of furnishing and placing reinforcing bars and threaded tie bar assemblies with reinforcing bars in accordance with 105.03.

703.02 Materials

Materials shall be in accordance with the following:

Reinforcing Bars, Plain or Epoxy Coated	910.01
Reinforcing Bar Splicing System.....	910.01(b)3
Support Devices	910.01(b)9
Threaded Tie Bar Assembly.....	910.01(b)2

All ~~uncoated reinforcing bars~~ plain and epoxy coated reinforcing bars shall be supplied from a source listed on the Department's list of Certified Uncoated Reinforcing Bar Manufacturers and Certified Reinforcing Bar Epoxy Coaters respectively.

The ~~various~~ sizes and lengths of reinforcing bars shall be marked plainly to facilitate inspection and checking.

703.03 Bar List

The *Contractor shall verify the quantity and size of the reinforcing bars shall be verified* against the structure drawings. ~~The necessary corrections, if any, shall be made before prior to ordering.~~ Errors in the bar list and bending schedule will not be cause for adjustment of the contract unit price.

703.04 Protection of Materials

~~Reinforcing bars shall be protected at all times from damage. When placed in the work, the reinforcing bars shall be free from dirt, harmful rust, detrimental scale, paint, oil, or other foreign substance. The various sizes and lengths shall be marked plainly to facilitate inspection and checking.~~

~~Epoxy coated reinforcing bars shall be handled and stored so as to prevent damage to the reinforcing bars and the coating. All systems for handling coated reinforcing bars shall have padded contact areas. All bundling bands shall be padded or banding shall be used which prevents damage to the coating. All bundles of coated bars shall be lifted with a spreader bar, multiple supports, or a platform bridge to prevent bar to bar abrasion from sags in the bundles of coated reinforcing bars. The reinforcing bars shall not be dropped or dragged. The bundled bars shall be stored above the ground on wooden or padded supports.~~

Plain and epoxy coated reinforcing bars shall be protected from damage during storage, handling, installation and concrete placement. Plain and epoxy coated reinforcing bars shall not be stored in direct contact with the ground. Epoxy coated reinforcing bars shall be protected from exposure to ultraviolet light and moisture during

storage. Once placed into the work, epoxy coated reinforcing bars shall not be exposed to ultraviolet light for a total of more than 21 days prior to placement of concrete. At the time of concrete placement, reinforcing bars shall be free of dirt, loose rust or scale, grease, oil, or other foreign substance. If the Engineer suspects the epoxy coating has been damaged by exposure to ultraviolet light, a sample will be obtained and submitted for testing shall will be tested in accordance with 910.01(b)9.

Damage to the epoxy coating of epoxy coated reinforcing bars shall be repaired or the bars shall be replaced. Repairs to the epoxy coating ~~on epoxy coated reinforcing bars~~ shall be performed on all damaged areas larger than 1/4 in. by 1/4 in. (5 mm by 5 mm). A bar will be rejected if the ~~total~~ accumulated area of damaged coating exceeds 2% of the nominal surface area of the bar or if the total area of repaired coating exceeds 5% of the nominal surface area of the bar. All damaged ~~within each~~ areas shall be cleaned and the repair shall be performed before visible oxidation appears. ~~The patching or Coating~~ repair material shall be in accordance with 910.01(b)9.

CONSTRUCTION REQUIREMENTS

703.05 Bending

Reinforcing bars required to be bent shall be accurately cold bent in a bending machine to the shapes shown on the plans. All bars in which cracks or splits occur at bends will be rejected.

703.06 Placing and Fastening

All dimensions shown on the plans for spacing of reinforcing bars apply to centers of bars unless otherwise noted. All bars shall be accurately placed and, during placing of the concrete, held firmly in the position as shown on the plans. Distances from the forms shall be maintained by means of chairs, ties, hangers, or other approved support devices. All reinforcing bars shall be wired rigidly or fastened securely at sufficient intervals to hold the bars in place. *Welding of reinforcing bars other than those used in precast members will not be permitted. Welding of reinforcing bars at intersections will not be permitted.* Chairs and supports holding upper layers of reinforcing bars shall support the transverse bars. The upper layer of reinforcing bars in bridge floors shall be tied or fastened at such intervals as necessary to prevent an upward or a lateral movement of a bar from the planned position.

Layers of reinforcing bars shall be separated by spacers. Reinforcing bars shall be separated from horizontal surfaces by being suspended or supported on approved chairs and spacers capable of supporting the designed loads. Supports and spacers shall be of such shape as to be easily encased in concrete. That portion which is in contact with the forms shall be non-corrosive and non-staining material. They shall be of an approved type. Vertical stirrups shall always pass around main tension members and shall be securely attached thereto. The use of pebbles, pieces of broken stone or bricks, metal pipe, wooden blocks, and similar devices for holding bars in position will not be permitted.

After being placed, reinforcing bars will be inspected and approved before the concrete is deposited. The positions of the reinforcing bars shall not be disturbed both during and after depositing the concrete. All concrete placed in violation of this requirement may be rejected and its removal will be required. Where reinforcing bars

project from construction joints, all mortar clinging to the reinforcing bars from previous pours shall be removed before the next enveloping pour is made.

All reinforcing bars shall be furnished in the full lengths shown on the plans unless splices are indicated. No other splicing will be allowed except with written permission. Unless otherwise shown on the plans, reinforcing bars shall be lapped 32 diameters to make a splice. Construction joints shall not be made within the limits of lapped bars. For lapped splices, reinforcing bars shall be placed in contact and rigidly clamped or wired in an approved manner. Insofar as possible, splices shall be staggered and well distributed or located at points of low tensile stress. Splices will not be permitted at points where the section does not provide a distance of at least 2 in. (50 mm) between the splice and the nearest adjacent bar or surface of the concrete.

When splicing is indicated or permitted, an appropriate splice system on the list of approved Reinforcing ~~Steel~~ Bar Splicing Systems may be used in lieu of lapped bars. The splicing system shall be installed in accordance with the manufacturer's recommendations.

Welded wire ~~fabric~~ reinforcement, when required, shall be placed as shown on the plans or as otherwise directed. The sheets shall overlap sufficiently to maintain uniform strength and shall be securely fastened at lapped ends and edges. The laps shall be no less than one mesh in width.

Spiral reinforcement, consisting of evenly spaced continuous spirals, shall be held firmly in place by attachment to vertical reinforcement. The spirals shall be held true to line by vertical spacers. Anchorage for spiral reinforcement shall be provided with 1 1/2 extra turns of the spiral rod or wire at each end of the spiral unit. Splices in spiral rods or wire shall be made with a lap of 1 1/2 turns.

Threaded tie bar assemblies may be used in lieu of spliced reinforcing bars shown on the plans. Threaded tie bar assemblies shall achieve the minimum load in accordance with 910.01(b)2. *The Contractor shall coat any exposed part of threaded bar assemblies in accordance with 910.01(b)2.*

703.07 Welding Reinforcing Bars

In lieu of tying, ~~only~~ reinforcing bars used in precast and precast prestressed concrete structural members may be welded in accordance with the following:

- (a) All welding procedures and welders to be employed shall be qualified to AWS D1.4. All welds shall either be QC inspected by an AWS Certified Welding Inspector or at a minimum signed off by an AWS Certified Welding Inspector. Welding will be permitted only at intersections of reinforcing bars. Splicing of the reinforcing bars by welding will not be permitted. Welds shall have a satisfactory appearance. As low a current as possible shall be used so as to preclude notching and undercutting and still provide a weld of the intended strength. Notching, or undercutting of the bars, or bars with a loss of cross-section resulting from welding will be cause for rejection of the bars so damaged and the bars shall be replaced as directed.*

(b) Reinforcing bars that are welded shall be in accordance with ASTM A 706. Epoxy-coated reinforcing that is welded shall have the epoxy coating removed in the vicinity of the weld. Once the welded area has cooled to below 90°F (32°C) and before visible oxidation appears, the weld and surrounding bare metal shall be cleaned and recoated in accordance with 910.01(b)9e.

703.07 ~~703.08~~ Method of Measurement

Reinforcing bars will be measured by the pound (kilogram) based on the theoretical number of pounds (kilograms) complete in place as shown on the plans or placed as ordered. The quantities of materials furnished and placed shall be based upon the calculated weights (masses) of the reinforcing bars actually placed in accordance with these specifications. The weights (masses) calculated shall be based upon the following tables.

English Table

Bar Designation No.	Weight per linear foot, pounds	Bar Designation No.	Weight per linear foot, pounds
1/4 in.	0.167	8	2.670
3	0.376	9	3.400
4	0.668	10	4.303
5	1.043	11	5.313
6	1.502	14	7.65
7	2.044	18	13.60

Metric Table

Bar Designation No.	Mass per meter, kilograms	Bar Designation No.	Mass per meter, kilograms
10	0.560	29	5.060
13	0.994	32	6.404
16	1.552	36	7.907
19	2.235	43	11.38
22	3.042	57	20.24
25	3.973		

Threaded tie bar assemblies will be measured by the number of assemblies placed.

Welded wire fabric reinforcement will not be measured.

703.08 ~~703.09~~ Basis of Payment

The accepted quantities of reinforcing bars will be paid for at the contract price per pound (kilogram), complete in place.

If the substitution of reinforcing bars larger than those specified is permitted, payment will be made for only that weight (mass) which would be required if the specified bars had been used.

If the use of reinforcing bar lengths shorter than those shown on the plans is permitted for convenience in transporting or placing the bars, payment will be based on the weight (mass) of the lengths shown on the plans.

Payment for threaded tie bar assemblies will be at the contract unit price per each, complete in place, If epoxy coating is specified, payment for the assemblies will be at the contract unit price per each for threaded tie bar assembly, epoxy coated.

Payment will be made under:

Pay Item	Pay Unit Symbol
Reinforcing Bars	LBS (kg)
Reinforcing Bars, Epoxy Coated.....	LBS (kg)
Threaded Tie Bar Assembly.....	EACH
Threaded Tie Bar Assembly, Epoxy Coated.....	EACH

The cost of metal chairs, spacers, clips, wire, or other mechanical means used for fastening or holding reinforcement in place, and laps shall be included in the cost of reinforcing bars. The cost of coating materials and repair of damaged *or removed* coating materials on reinforcing bars and on metal chairs, spacers, clips, or other mechanical means used for fastening or holding reinforcement in place, and laps shall be included in the cost of epoxy coated reinforcing bars. If threaded tie bar assemblies are used in lieu of spliced reinforcing bars as shown on the plans, the cost of such assemblies shall be included in the cost of reinforcing bars. ~~The cost of protecting plain and epoxy coated reinforcing bars shall be included in the cost of either reinforcing bars or epoxy coated reinforcing bars.~~

~~The cost of qualifying the welders and welding procedures shall be at the expense of the Contractor and will be considered incidental to and included in the pay items of this section.~~

If welded wire ~~fabrie~~ reinforcement is required, the cost of furnishing and placing it shall be included in the cost of the concrete in which it is placed.

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 703, CONTINUED.

Other sections containing
specific cross references:

604.10 Pg 357 705.04 Pg 486
604.11 Pg 357 705.05 Pg 486
609.06 Pg 370 706.03 Pg 487
609.13 Pg 371 706.05 Pg 489
609.14 Pg 374 706.06 Pg 489
702.27 Pg 475 714.07 Pg 544
702.28 Pg 475 714.08 Pg 544
704.07 Pg 484 713.03 Pg 564
704.08 Pg 485 717.09 Pg 566
705.03 Pg 485 910.01(b)9 Pg 770

Recurring Special Provisions
potentially affected:

703-C-198

Motion: Mr. Heustis

Second: Mr. Cales

Ayes: 10

Nays: 0

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Passed as revised

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☐ Technical Advisory

Received FHWA Approval? Yes

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: The INDOT Technicians performing inspection at the various fabrication facilities have commented that the current 707 specification needs updating. Right now the fabrication facilities do not have to be certified, they just need to be "an approved plant". Also, the mild reinforcing steel used in the manufacturing of beams is allowed to be welded and is being welded, but is not a weldable grade of steel. Other minor issues such as requirements for the temperature of concrete at the time of placement and the size of the cylinders are also not addressed.

PROPOSED SOLUTION: Review the 707 section of the SS. Incorporate NPCA & PCI certification programs into the specification via ITM 814. Give the fabrication facility the option to either tie or weld the reinforcing cages however, if they are welded, A 706 (weldable reinforcing steel) shall be used. Other minor issues such as temperature limits on the concrete at time of placement, similar to that contained in 702 were addressed. (Standards Committee has already passed a proposal to remove information related to strand breaks from the standard drawings and incorporate into the SS. See Items from September 2007, 08-4-3 & 08-4-4.)

APPLICABLE STANDARD SPECIFICATIONS: 707, 910.01(a), 910.01(b)7

APPLICABLE STANDARD DRAWINGS: None

APPLICABLE DESIGN MANUAL SECTION: None

APPLICABLE SECTION OF GIFE: new GIFE section 707

APPLICABLE RECURRING SPECIAL PROVISIONS: None

Submitted By: Ron Heustis for Jim Reilman (chairman 700 spec subcommittee)

Title: Manager, Construction Technical Support

Organization: INDOT

Phone Number: 317-234-2777

Date: April 15, 2008

APPLICABLE SUB-COMMITTEE ENDORSEMENT? 700 Spec Subcommittee. Also have provided Industry an opportunity to review & comment.

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 707, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

**SECTION 707 – PRECAST AND PRECAST PRESTRESSED CONCRETE
STRUCTURAL MEMBERS****707.01 Description**

This work shall consist of the ~~construction and~~ *fabrication*, furnishing, and *installation* of reinforced *precast* or *precast* prestressed concrete structural members or, if specified, concrete deck panels cast outside the structure, transported to, and incorporated into the structure, *all* in accordance with 105.03.

707.02 Materials

Materials shall be in accordance with the following:

<i>Admixture for Concrete</i>	912.03
Coarse Aggregates, Class A or Higher, Size No. 91.....	904
Concrete Curing Materials and Admixtures	912
Concrete Sealers.....	909.09, 909.10
Elastomeric Bearings	915.04
Fine Aggregates, Size No. 23.....	904
Fly Ash.....	901.02
Portland Cement.....	901.01(b)
Prestressing Steel Strand	910.01(b)7
Reinforcing Steel Bars	910.01

Structural steel for steel intermediate diaphragms shall be in accordance with 910.02(a) and shall be galvanized in accordance with ASTM A 123 after cutting, bending, and welding. Bolts for steel intermediate diaphragms shall be 7/8 in. (22 mm) and in accordance with 910.02(e)1, except they shall be type 1. All bolts, nuts, washers, and similar threaded fasteners shall be galvanized in accordance with ASTM A 123 or may be mechanically zinc coated in accordance with ASTM B 695, class 50.

707.03 General Requirements

Structural members including ~~bridge slabs~~, *concrete deck panels*, box-beams, and I-beams, and *bulb-Tee beams* shall be manufactured in an *Department* approved plant ~~where strict control over manufacturing and curing procedure is maintained at all times in accordance with ITM 814~~. Dimensions and design requirements for structural members shall be as shown on the plans. Lengths and dimension tolerances shall be as shown on the plans or as otherwise specified.

A beam whose dimensions exceed the tolerances shown on the plans or as otherwise specified will be rejected for shipment to the project site. A beam which is to include a field attached curb shall have curb reinforcement located longitudinally within 3/4 in. (20 mm) of the locations shown on the plans.

~~Wire breaks will be permitted to remain on the prestressed concrete casting bed as follows:~~

<i>Number of Strands in Bed</i>	<i>Wire Breaks</i>
<i>19 or Fewer</i>	<i>0</i>
<i>20 through 39</i>	<i>1</i>
<i>40 through 59</i>	<i>2</i>
<i>60 or More</i>	<i>3</i>

~~The ends of each permitted wire break shall be tied to the strand. If more than the permissible number of wire breaks appears in a particular strand pattern, or if more than one broken wire appears in an individual strand, such strands shall be removed and replaced.~~

~~The tolerance for the center of gravity for a prestressing strand group shall be $\pm 1/4$ in. (± 6 mm). The tolerance for the longitudinal position of handling devices shall be ± 6 in. (± 150 mm).~~

Structural steel diaphragms shall be fabricated and erected in accordance with 711. Steel diaphragms shall include all connection angles, plates, and associated hardware required for a complete installation. The Contractor shall replace, re-galvanize, or repair all damaged galvanized material at the discretion of the Engineer.

If detailed design drawings are not included in the plans, ~~one set of design computations and four sets of detailed~~ shop drawings shall be submitted for approval in accordance with 105.02. ~~The submitted drawings shall be 22 in. by 34 in. (560 mm by 860 mm) in overall size. These shop drawings will be reviewed for design features only. The Contractor shall be responsible for dimensions, accuracy, and fit of work.~~ Certified mill test reports shall be furnished for all high tensile steel strands. ~~If a method of handling members other than that described in 707.08 is to be used, it shall be shown on the shop drawings.~~ Fabrication shall not begin until the shop drawings are approved. ~~The Contractor shall allow 14 days in the project schedule for the review of shop drawings.~~

Prior to the beginning of fabrication on each contract, the fabricator shall hold a prefabrication meeting at the fabrication facility or another location agreed to by all parties. The meeting shall be conducted by the Quality Control Inspector (QCI) and attended by the fabricator's production supervisor, and the Engineer or his representative. The QCI shall take notes of the meeting and distribute copies to all attending parties within five days of the date of the meeting. Items to be discussed at the meeting shall include a minimum of fabrication and shipping schedule including hours of operation; line of communication between fabricator and Engineer; material test reports; shop drawings; special fabrication methods; fabrication hold points for inspection; final inspection and acceptance of materials; method of shipment. The requirement to hold prefabrication meetings may be waived by the Department, if the Department so chooses.

Where temperature requirements are specified herein, the fabricator shall provide the Department with written verification that the temperature requirements have been met.

CONSTRUCTION REQUIREMENTS

707.04 Steel and Concrete Requirements

(a) Reinforcing Steel Bars

A tight coat of concrete grout *extending 1/2 in. maximum from the top of precast and precast prestressed concrete members* will be permitted to remain on ~~stirrups~~ reinforcing bars extending from precast and precast prestressed members. All loose and flaky material on these reinforcing bars shall be removed. Lap splices shall be in accordance with 703.06.

(b) Welding Reinforcing Steel

In lieu of tying, reinforcing steel bars except prestressing steel strands may be welded in accordance with the following: 703.07.

1. ~~Welding will be permitted only at intersections of bars. Splicing of the reinforcing steel by welding will not be permitted. Welds shall have a satisfactory appearance. There are no numerical strength requirements for the completed welds. However, they shall be of such strength as to adequately hold the crossing bars in their true position during the placement of concrete. As low a current as possible shall be used so as to preclude notching and undercutting and still provide a weld of the intended strength. Notching or undercutting of the bars will be cause for rejection of the bars so damaged and the bars shall be replaced as directed.~~
2. ~~Welding shall be by the shielded metal arc process using only electrodes with low hydrogen classifications E7015, E7016, E7018, or E7028 in accordance with AWS A5.1. No minimum preheat or interpass temperature is required, except that welding shall be done only when the base metal temperature is above 35°F (2°C). The low hydrogen electrodes shall be dried for at least 2 h at a temperature between 450°F (232°C) and 500°F (260°C) before they are used. Electrodes shall be stored immediately after drying in a storage oven held at a temperature of at least 250°F (121°C). Electrodes that are not used within 4 h after removal from a drying or storage oven shall be re-dried before use. Electrodes which have been wet shall not be used.~~
3. ~~All welding procedures and welders to be employed shall be qualified by tests as prescribed below. Evidence may be accepted of previous qualification of the welding procedures and welders to be employed. The same bar stock and type of welding equipment that is required for fabrication of the steel shall be used in qualifying welding procedures and welders. Welding procedures shall be qualified by preparing and testing two sample welds of each combination of bar size and steel type to be welded at intersections in the construction work. Each sample shall be subjected to a tensile test across the point of the weld. The specimens shall develop the minimum requirements for tensile strength and yield strength of the bar stock. However, failure to be in accordance with the percentage of elongation specified for the steel~~

~~bars used will not be cause for disqualifying the welding procedure or the welder.~~

- ~~4. Welders shall be qualified by preparing and testing samples in the same manner as specified above for qualification of welding procedures. Preparation of welds for qualifying procedures and welders shall be done in the presence of the Engineer. Such inspection shall be requested at least five days in advance. All necessary equipment, personnel, and materials shall be assembled and any experimental work performed so that qualification of welders and welding procedures can be concentrated on a reasonably short and continuous period of time. The cost of qualifying the welders and welding procedures shall be at the expense of the Contractor and will be considered incidental to and included in the pay item for structural members, except that testing of the specimens will be performed by the Department at no expense to the Contractor.~~

(b) Prestressing Strands

The splicing of straight prestressing strands is acceptable provided that the location of the splice does not occur within the concrete member and the splices meet AASHTO M 203. Splicing of draped strands is not allowed. Spliced prestressing strands shall have the same "twist" or "lap". For single strand tensioning slippage of the splices should be considered in computing the elongation. For multiple strand tensioning, either all of the strands shall be spliced or not more than 10% of the strands. If all of the strands are spliced the average splice slippage shall be considered in computing the elongation. If 10% or less of the strands are spliced, slippage allowance shall be required.

Wire breaks will be permitted to remain on the prestressed concrete casting bed as follows:

<i>Number of Strands in Bed</i>	<i>Wire Breaks</i>
<i>19 or Fewer</i>	<i>0</i>
<i>20 through 39</i>	<i>1</i>
<i>40 through 59</i>	<i>2</i>
<i>60 or More</i>	<i>3</i>

The ends of each permitted wire break shall be tied to the strand. If more than the permissible number of wire breaks appears in a particular strand pattern, or if more than one broken wire appears in an individual strand, such strands shall be removed and replaced.

The tolerance for the center of gravity for a prestressing strand group shall be $\pm 1/4$ in. (± 6 mm). The tolerance for the longitudinal position of handling devices shall be ± 6 in. (± 150 mm).

(c) Concrete

Concrete shall be air entrained and in accordance with the applicable requirements of 702.05. *The concrete shall have a minimum temperature of 50°F (10°C) and a maximum temperature of 90°F (32°C) at the time of placement.* Chemical admixture types A, D, F, or G shall may be used in combination with an air entraining

admixture. High range water reducing, HRWR, and high range water reducing retarding, HRWRR, admixture systems may be used. Chemical admixture types B, C, and E will be permitted only with written permission. Admixtures, other than air-entraining admixtures, shall not be used with air-entrained cement. The cement content of the mixed concrete shall be sufficient to obtain the specified minimum 28 day compressive strength. The total of portland cement and other cementitious materials shall not exceed 800 lb/cyd (475 kg/m³). Slump shall be no less than 2 in. (50 mm) nor more than 5 in. (125 mm) for concrete without chemical admixtures or concrete containing chemical admixture types A and D.

Concrete containing admixture type F, G, or admixture systems shall have a slump no less than 3 in. (75 mm) nor more than 7 8 in. (475 200 mm). The amount of time from mixing to placement and consolidation shall be a maximum of 30 min. The concrete shall not be retempered with additional amounts of chemical admixture types F or G after the initial mixing has been completed.

1. Cold Weather Concrete

The provisions of 702.11 shall be followed when it is necessary to fabricate concrete structural members when the atmospheric temperature is at or below 35°F (2°C). In addition to the requirements of 702.11, two maximum-minimum type thermometers shall be provided in the enclosure.

2. Hot Weather Concrete

When it is necessary to fabricate concrete structural members during times of hot weather the mix water may be chilled or an appropriate amount of ice may be added to the concrete mix in order to produce concrete of the temperature specified in 707.04(c).

3. Compression Testing for Acceptance

A minimum of two 6 in. dia. x 12 in. test cylinders per member cast (group) shall be made and cured in accordance with ASTM C 31. The use of alternate test cylinder sizes requires pre-approval by the Department. Additional test cylinders may be cast and tested prior to 28 days for acceptance; however the compressive strength shall still be performed on the 28 day test cylinders. Test cylinders shall be tested in accordance with ASTM C 39. The results of the 28 day test cylinders will determine acceptance or rejection of the concrete compressive strength in accordance with one of the following options.

- a. If the compressive strength of all cylinders tested for a group are equal to or greater than the design concrete strength, the compressive strength of the concrete in that group of members will be accepted.*
- b. If the average compressive strength of all cylinders tested is equal to or greater than the design concrete strength, not more than 10% of the cylinders tested have a compressive strength less than the design concrete strength, and no cylinder tested has a compressive strength less than 80% of the design concrete strength, then the compressive strength of the concrete in the group of members will be accepted.*

- c. *If the compressive strength or average compressive strength does not comply with 707.04(c)3 a or b, the acceptability of the member will be determined by the Department.*

Failure to meet the strength requirements will be cause for rejection of the concrete member for which the cylinders represent. All molds, facilities, and materials necessary to prepare and cure the test specimens shall be furnished.

Precast concrete members which are not prestressed shall have a minimum compressive strength of 4500 psi (31 MPa) in 28 days. *Precast prestressed* members shall be in accordance with the following unless otherwise shown on the plans:

1. Maximum water/cementitious ratio in pounds (kilograms) of water per pound (kilogram) of cementitious material shall be 0.400.
2. Minimum 28 day compressive strength of concrete shall be 5000 psi (34.5 MPa).
3. Minimum compressive strength of concrete at time of prestressing shall be 4000 psi (27.6 MPa).
4. Initial tension of prestressing ~~steel strands~~ shall be as shown on the plans.

Inspection of the precast *prestressed* member during manufacture and checking and testing aggregates, cement, concrete, and steel specimens will be performed. All specimens shall be furnished without cost to the Department. Notification shall be made as soon as ~~reinforcing steel reinforcement~~ is available for sampling and testing, and also at least five days in advance of the beginning of the manufacture of the precast *prestressed* member. This *quality assurance* inspection, checking, and testing performed by the Department ~~will~~ *does* not relieve the Contractor or ~~his~~ *the* manufacturers from performing their own *quality control* inspection, testing, and checking as necessary to maintain strict control over the manufacturing, handling, and curing procedure. ~~By means of a mechanical recording device, a~~ A permanent record of the ~~force applied measured elongation obtained to each prestressing strand of prestressing steel~~ and the identification of the strand and unit to which the record applies shall be provided. *This record shall be verified by the Contractor and the Engineer.*

707.05 Forms

Structural members shall be manufactured in steel forms which are unyielding, *smooth*, mortar-tight, and of sufficient rigidity to prevent distortion due to pressure of the concrete. They shall be so designed that the finished concrete is in accordance with the required dimensions and contours. The design of the forms shall take into account the effect of vibration of the concrete as it is placed. Forms shall be filleted at all sharp corners and shall be given a bevel or draft at all projections to ensure easy removal. Exposed edges of curbs shall be beveled or edged. Forms shall be set and maintained true to the lines designated until the concrete is sufficiently hardened or for periods hereinafter specified. Interiors of forms shall be treated with an approved formulated form coating which allows them to be released without adhering, discoloring, or otherwise damaging the concrete. Form coating materials shall not come in contact with reinforcing *bars* or prestressing ~~steel strands~~.

707.06 Placing and Finishing Cement Concrete

The temperature of the prestressing strands and forms shall be monitored between the time of the application of prestressing force and the placement of the concrete. During hot weather, appropriate approved means shall be undertaken to cool the prestressing strands and forms immediately prior to placement of the concrete.

Concrete, during and immediately after depositing, shall be consolidated with vibrators and suitable spading tools. Vibration shall be applied at the point of deposit and in the area of freshly deposited concrete. The vibrators used may be internal, external, or a combination of both. Internal vibration shall be of sufficient duration and intensity to consolidate thoroughly, but shall not be continued so as to cause segregation. Vibration shall not be continued at any one point so that localized areas of grout are formed.

The entire operation of depositing and consolidating the concrete shall be conducted so that the concrete will be smooth, dense, and free from any honeycomb or pockets of segregated aggregates. The concrete in each member shall be placed in one continuous operation. The outside vertical faces of fascia girders and the exposed face and top of the curb section shall be finished in accordance with 702.21.

Voids in prestressed concrete box beams shall be vented during beam production until after the initial concrete set, then sealed before the beams are shipped.

The tops of all beams and the outside faces *and bottom flanges* of the fascia beams shall be sealed with an approved concrete sealer in accordance with 709.

707.07 Removal of Forms and Curing

Side forms may be removed when no distortion, slump, or misalignment of the concrete will result. Precast members which are not prestressed shall remain on the bottom supporting forms for the span until the concrete has reached a strength of at least 2,000 psi (13.8 MPa) as evidenced by test cylinders made and cured in the same manner as the slab.

Curing may be done by wet curing or by accelerated curing.

When wet curing is used, the exposed surfaces of the members shall be covered by two layers of wet burlap and the burlap shall be kept wet. Additional curing of precast or *precast* prestressed units will not be required provided the minimum specified ultimate strength can be obtained.

When accelerated curing of the concrete is used, it shall be done by low pressure steam or radiant heat curing. Insulated blankets may be used to reduce heat and moisture loss subject to maintaining a 50°F (10°C) minimum temperature. The heat shall always be applied at a controlled rate following the initial set of the concrete, and an effective method of retaining the heat and moisture in the concrete shall be used during the curing cycle.

Curing shall be in a suitable enclosure to minimize heat and moisture loss. Except to maintain a minimum temperature of 50°F (10°C), heat shall not be applied until the concrete has attained its initial set. The time of initial set may be determined by ASTM C 403. When the initial set is not determined by ASTM C 403, the initial application of

heat shall be from 2 to 4 h after final placement. If retarders are used, this time shall be increased to 4 to 6 h.

During the initial application of radiant heat or live steam, the ambient temperature within the curing enclosure shall increase at an average rate not exceeding 40°F/h (5°C/h) until the curing temperature is reached. Neither the maximum temperature within the enclosure nor the maximum temperature on the surface of the concrete shall exceed 160°F (71°C). The maximum curing temperature shall be held until the concrete has reached the minimum required strength for moving precast *and precast prestressed* units. *In discontinuing the steam application, the air temperature inside the enclosure shall decrease at a rate not to exceed 70°F/h (20°C/h) until the temperature has reached 20° F above the temperature of the air to which the concrete will be exposed. Recording thermometers shall be provided and used to check these temperature requirements.* Detensioning should be accomplished immediately after accelerated curing has ~~been discontinued~~ concluded, provided the member has met or exceeded the specified release strength. When multiple members are cast in the same bed, all members shall meet or exceed the specified release strength prior to detensioning. Additional curing of precast or precast prestressed units will not be required provided the minimum specified ultimate strength can be obtained.

Radiant heat may be applied by means of pipes circulating steam, hot oil or hot water, or by electric heating elements. When steam is used, the jets shall be positioned so that they do not discharge directly on the concrete, forms, or test cylinders. ~~†~~The steam shall be at 100% relative humidity to prevent loss of moisture and to provide moisture for proper hydration of the cement.

During the period of initial set of the member and during the accelerated curing by radiant heat, the concrete shall be kept wet by the method outlined above for wet curing.

~~A recording thermometer shall be provided and used to verify compliance with the temperature requirements.~~

Approval shall be obtained before curing is done by any means other than those outlined above.

707.08 Handling and Shipping

~~The precast~~ Precast *and precast prestressed* members shall not be subjected to excessive abuse which produces crushing or undue marring of the concrete. All members damaged during handling, storing, transporting, or erecting shall be replaced. Unless some other method is approved, precast *and precast prestressed* members shall be handled with a suitable hoisting device provided with a spreader sling. The spreader shall be of sufficient length to prevent horizontal forces being produced in the member due to lifting and shall be equipped with leads and hooks at each end. The girders shall be lifted by the devices shown on the plans. Alternate lifting devices and procedures shall be at the owner's or supplier's option, and must be approved prior to use. ~~If any other method of handling is used, it shall be shown on the shop drawings and approved prior to use.~~ If the method produces horizontal forces in the precast *or precast prestressed* member, sufficient steel reinforcement shall be added to compensate for them.

The members shall remain in an upright position at all times and shall be supported as indicated herein when in storage and during transportation to the construction site.

In storage, I-beams, box-beams, and slabs shall be fully supported across their width on battens not less than 4 in. (100 mm) wide with one being placed at each end at the centerline of the bearing. The supports of the members while in storage shall be maintained in a level position so no twisting occurs.

~~The p~~ Precast members shall not be shipped nor used until the concrete reaches a strength of 4,500 psi (31 MPa) for members which are not prestressed and 5,000 psi (34.5 MPa) for members which are prestressed as evidenced by test cylinders made at the time of casting and cured in the same manner as the ~~precast~~ members which they represent. If they are shipped prior to 28 days, additional test cylinders shall be made to ensure adequate 28 day results in case of earlier failure.

During transportation, the members shall be supported with truck bolsters or battens no less than 4 in. (100 mm) wide which are padded with no less than 1/2 in. (13 mm) of rubber. The ends of I-beams shall extend no more than the depth of the beam and not more than 3.5 ft (1 m) beyond the supports. The ends of box-beams shall extend no more than 1 1/2 times their depth and not more than 3 ft (0.9 m) beyond the supports. The ends of slabs shall extend no more than the depth of the beam beyond the supports. Supports of cantilever beams shall be as shown on the plans. Trucks with double bolsters will be permitted, provided the beams are fully seated on the outer bolsters and the inner bolsters are no more than 8 ft (2.4 m) from the ends of the beams. Wood blocks or other suitable material shall be placed under the tie chains to prevent chipping the concrete.

707.09 Placing Structural Members

Erection of ~~the~~ precast *prestressed structural members* ~~deck~~ shall commence at the centerline and proceed out to the curb, one member at a time. As each member is placed, the transverse tie bars, if shown on the plans, shall be inserted and secured. Any shifting of the members shall be done while they are held free of the supports by the hoisting device. The use of a steel pinch bar will not be permitted. Members shall be set to proper line and grade with uniform bearing on bridge seats, mortar joints, or bearing pads as required on the plans. When required, members shall be secured to the pier or bent with dowel rods. Holes for dowels shall be filled with mortar at fixed ends and with crack or joint filler at expansion ends. Longitudinal keyway joints shall be cleaned. A coat of cement mortar shall be scrubbed on the surface. The joint shall be filled with a non-shrinking grout composed of one part portland cement, two parts No. 23 fine aggregate, and an approved non-shrinking additive or a non-shrink, non-metallic cementation grout in accordance with ASTM C 1107. All bolts or drains shown on the plans as necessary or desirable to be placed in the concrete shall be placed by the methods and at the locations shown on the plans. Necessary tie rods, tie bolts, and hardware for tying members together shall be furnished.

Dowel holes shall not be grouted nor concrete or the forming ~~therefor~~ *thereof*, be placed in floor slabs, diaphragms, or shear keys prior to receipt of complete documentation of the acceptability of the members and bearing pads, including the satisfactory laboratory reports and certifications in accordance with 915.04(e). Neither the members, nor the bearings will be considered incorporated into the work, and neither will be paid for until this documentation is accomplished satisfactorily.

Railing, when required, shall be of the type shown on the plans. The component parts shall be in accordance with 706, unless otherwise indicated on the plans. Other precast or *precast* prestressed structural members shall be placed in the structure in accordance with the plans and the specifications or special provisions indicated for the type of structure being built.

Cranes or other heavy erection equipment may be operated on the precast or *precast* prestressed members only if approved in writing and if a proposed operating procedure is submitted showing loading, distribution of loads, resulting stresses, and that the design of the members is satisfactory to permit. However, such approval shall not relieve the Contractor of any damage from this operation.

707.10 Precast Prestressed Concrete Deck Panels

Precast prestressed concrete deck panels shall be designed as a non-composite section to support the dead load of the panel, reinforcement, plastic concrete, and a construction load of 50 lb/ft² (2.4 kPa). The panel shall be designed as a composite section with the class C concrete to support the live load. The Contractor shall revise the area of top longitudinal reinforcing ~~steel bars~~ over interior supports for negative moment to be equal to the total area of top and bottom longitudinal reinforcing ~~steel bars~~.

Shop drawings ~~and design computations~~ shall be submitted in accordance with ~~707.03~~ 105.02. Design computations ~~for deck panels~~ shall be submitted ~~for approval only~~ for total slab thicknesses greater than 8 in. (200 mm) or clear spans in excess of 7.5 ft (2.3 m). Design shall be in accordance with the AASHTO ~~Standard~~ *Load Resistance Factor Design Bridge Specifications for Highway Bridges*. Details such as type, size, and location of the reinforcing ~~steel bars~~, the prestressing strands, welded wire ~~fabric~~ *reinforcement*, and concrete shall be as shown on the plans.

The concrete for deck panels shall be placed in accordance with 702.20. The concrete shall be vibrated to prevent honeycombs and voids, especially at the corners and edges of the panels. The tops of the deck panels shall be broom or wire brush finished in the direction of the prestressing strands. The corrugations formed shall be uniform in appearance and shall not be more than 1/4 in. (6 mm) in depth. The coarse aggregate shall not be displaced when preparing the roughened surface.

707.11 Method of Measurement

Precast or *precast* prestressed concrete structural members will be measured by the linear foot (meter) along the top of each member or by the square foot (square meter) of top surface of each member. Railing will be measured in accordance with 706.05 if specified as a pay item. Structural steel for intermediate diaphragms will not be measured.

707.12 Basis of Payment

The accepted quantities of precast or *precast* prestressed concrete structural members will be paid for at the contract unit price per linear foot (meter) or per square foot (square meter) for structural member, concrete, of the type and size specified. Precast or *precast* prestressed concrete structural members for which the type and size is not shown in the Schedule of Pay Items will be paid for at the contract lump sum price for structural members, concrete.

Railing will be paid for in accordance with 706.06 when specified as a pay item.

Payment will be made under:

Pay Item

Pay Unit Symbol

Structural Member, Concrete, _____, _____LFT (m)
type size SFT (m2)

Reinforcing ~~steel bars~~, elastomeric bearing pads, bearing beams required for box beams, bearing assemblies required for I-beams, bulb-T beams, and box beams, bearing plates, expanded polystyrene, threaded reinforcing bars, threaded inserts in fascia beams, hex bolts, sealer on the outside face *and bottom flange* of fascia beams and on the tops of all beams, and necessary incidentals shall be included in the cost of ~~this work~~ *the pay items of this section. The cost for providing all molds, facilities, and materials necessary to prepare and cure the test specimens required for work in this section shall be included in the cost of the pay items of this section.*

No payment will be made for *removing and replacing prestressing strands due to excessive wire breakage, or replacing precast or precast prestressed members damaged during handling, storing, transporting or erecting.*

The cost of railing shall be included in the cost of ~~this work~~ *the pay items of this section* if such railing is not specified as a pay item.

The cost of all materials, including galvanizing, labor, and equipment for furnishing and installing steel intermediate diaphragms shall be included in the cost of structural member, concrete of the type and size specified.

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 707, CONTINUED.

Other sections containing
specific cross references:

702.13(f) Pg 459

707.10 Pg 497

Recurring Special Provisions
potentially affected:

None

Motion: M

Second: M

Ayes:

Nays:

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Withdrawn

7/11/08

**INDIANA DEPARTMENT OF TRANSPORTATION
OFFICE OF MATERIALS MANAGEMENT**

**CERTIFIED PRECAST PRESTRESSED
CONCRETE PRODUCER PROGRAM
ITM 814-08P**

1.0 SCOPE.

- 1.1** This procedure covers the requirements for a precast prestressed concrete plant to become a Department Certified Precast Prestressed Concrete Producer for precast prestressed concrete structural members.
- 1.2** All precast prestressed concrete structural members are required to be in accordance with the Department Standard Specifications.
- 1.3** The fabrication facility shall have a NPCA certification or a PCI B3 certification to fabricate a precast prestressed concrete structural member with straight-strands. The fabrication facility shall have a PCI B4 certification to fabricate a precast prestressed concrete structural member with deflected-strands.
- 1.4** This procedure may involve hazardous materials, operations, and equipment and may not address all of the safety problems associated with the use of the test method. The user of this ITM is responsible for establishing the appropriate safety and health practices and determining the applicability of regulatory limitations prior to use.

2.0 TERMINOLOGY. Definitions for terms and abbreviations shall be in accordance with the Department's Standard Specifications Section 101 and the following:

- 2.1** Addenda. Any addition or deletion to the plant-specific NPCA Quality Control Manual or PCI Quality Systems Manual.
- 2.2** Approved Lists. A compilation of lists identified in the Department Standard Specifications that require products, sources, equipment or other specified items to be approved and on a list prior to consideration for use on a Department contract.
- 2.3** Audit. An inspection conducted by an independent party selected by the NPCA or PCI that verifies compliance with the NPCA or PCI Plant Certification programs.

- 2.4 Certified Precast Prestressed Concrete Producer. A precast prestressed concrete structural producer certified by the NPCA or PCI, and in accordance with the Program.
 - 2.5 Management Representative. Person responsible for maintaining the requirements of the Program and liaison with the Department.
 - 2.6 NPCA. National Precast Concrete Association.
 - 2.7 PCI. Precast/Prestressed Concrete Institute.
 - 2.8 Program. ITM 814.
 - 2.9 Quality Assurance. All those planned and systematic actions necessary to provide confidence that a product or facility will perform satisfactorily in service.
 - 2.10 Quality Control. The system used by a contractor to monitor, assess and adjust their production or placement process to ensure the final product will meet the specified level of quality.
 - 2.11 Quality Systems Manual/Quality Control Manual. The plant-specific guidelines that indicate the production, policies, and procedures used by the plant.
- 3.0 **SIGNIFICANCE AND USE.** The Certified Precast Prestressed Concrete Producer Program is a program whereby the Producer takes responsibility for the production of precast prestressed concrete structural members in accordance with contract requirements and the quality control procedures. The Department will conduct quality assurance for acceptance and monitor the Producer's quality control procedures.
- 4.0 **QUALITY CONTROL PLAN.** Each Producer providing precast prestressed concrete structural members under the Program shall have a written Quality Systems Manual or Quality Control Manual that shall be plant-specific and be the basis of control. The manual shall contain, but not be limited to, the methods of production and quality control policies and procedures used by the plant. The manual shall be in accordance with the NPCA or PCI Plant Certification requirements.
- 5.0 **CERTIFICATION.**
- 5.1 Each plant requesting to become a Certified Precast Prestressed Concrete Producer shall do so in writing to the Manager, Office of Materials Management. The request shall include verification of certification issued by the NPCA or PCI, a copy of the most recent audit conducted in accordance with the NPCA or PCI certification programs, a copy of the response to non-conformances of the audit, if applicable, a copy of the plant-specific Quality Systems Manual or Quality Control Manual, and the designated Management Representative for the plant.

- 5.2** Each Precast Prestressed Concrete Producer meeting the requirements of the Program will be certified upon verification of the required documents of 5.1.
- 5.3** Each Certified Precast Prestressed Concrete Producer is required to submit to the Office of Materials Management a copy of the audits and the response to non-conformances of the audits, if applicable, to verify compliance with the NPCA or PCI Plant Certification programs. Also, any addenda to the plant-specific Quality Systems Manual or Quality Control Manual are required to be submitted.
- 5.4** In the event of a change in ownership of the Certified Precast Prestressed Concrete Producer, the certification shall expire on the date of such change. The new ownership may avoid expiration by submitting a statement to the Office of Materials Management indicating recognition of the details of the Program and verification that the plant is in accordance with the NPCA or PCI Plant Certification program requirements.

6.0 DEPARTMENT RESPONSIBILITIES.

- 6.1** The Department may conduct inspections on a random basis of each Certified Precast Prestressed Producer.
- 6.2** The Department will maintain the List of Approved Certified Precast Prestressed Concrete Producers.
- 6.3** The removal of a plant from the Department's List of Approved Certified Precast Prestressed Concrete Producers will be the responsibility of the Manager, Office of Materials Management. The Producer shall have the right to appeal the removal from the Department's List of Approved Certified Precast Prestressed Concrete Producers to the Director, Construction Management Division.

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 910, BEGIN LINE 3, DELETE AND INSERT AS FOLLOWS:

910.01 Reinforcing Bars and Dowel Bars**(a) General**

Unless otherwise specified, bars for concrete reinforcement shall be deformed billet steel, grade 60 (420). Tie bar assemblies used in lieu of bent tie bars shall be in accordance with the minimum total ultimate strength and minimum total yield strength requirements specified for bent tie bars; bend test and elongation will not be required.

~~Reinforcing steel~~ *Reinforcement* used in precast or precast prestressed concrete structural members, including deck panels, shall be in accordance with ASTM A 615 grade 60 (A 615M, Grade 420) *if it is to be tied. Reinforcing used in precast or precast prestressed concrete structural members, including deck panels, shall be in accordance with ASTM A 706 grade 60 (A 706M, Grade 420) if it is to be welded.*

Reinforcing bars shall be furnished by selecting bars made by a manufacturer on the list of Certified Uncoated Reinforcing Bar Manufacturers and in accordance with ITM 301. When shipped to the project site, the reinforcing bars shall be accompanied by the type of certifications specified in ITM 301 and in accordance with 916.

SECTION 910, BEGIN LINE 26, DELETE AND INSERT AS FOLLOWS:

2. Threaded Tie Bar Assembly

The threaded tie bar assembly shall be deformed billet steel, grade 60 (420) *or higher*, in accordance with 910.01(b)1 and a coupling device. The tie assembly shall achieve a minimum load of 76.144 kip/in.² (525 MPa). *Where epoxy coated threaded tie bar assemblies are specified, A an epoxy coating with a minimum film thickness of 6 mils (150 µm) shall be applied to the coupling device and epoxy coated reinforcing bars shall be provided in accordance with 910.01(b)9 with the exception that the epoxy coated bar is not required to be furnished from the list of Certified Reinforcing Bar Epoxy Coaters.*

SECTION 910 BEGIN LINE 77, DELETE AS FOLLOWS:

7. Uncoated 7 Wire Strand for Prestressed Concrete

Uncoated 7 wire strand for prestressed concrete shall be in accordance with ASTM A 416. The strand shall have the minimum tensile strength of and initial tension shown on the plans.

~~Low relaxation strand with a nominal diameter of 1/2 in. (12.70 mm) and a cross sectional area of 0.167 in.² (108 mm²) shall have a breaking strength of 45,000 lb (20,400 kg).~~

Uncoated 7 wire strand shall be covered by the type of certification specified in the Frequency Manual and in accordance with 916.

9. Epoxy Coated Reinforcing Bars

Epoxy coated reinforcing bars shall be furnished by selecting bars coated from an applicator's plant on the list of Certified Reinforcing Bar Epoxy Coaters and in accordance with ITM 301. The epoxy coating material shall be selected from the list of approved Epoxy Coating for Steel.

Epoxy coated reinforcing bars shall be in accordance with ASTM A 775 (A 775M), except as follows.

- a. the ~~steel~~ bars shall be in accordance with 910.01(b)1;
- b. the coating color shall contrast with the color of iron oxide;
- c. tensile and bend tests shall be performed on the bars. If an examination of the bend test specimen suggests the need, the adhesion of the coating shall be checked by subjecting additional specimens to the 120° bend test. Hairline cracks without bond loss will be acceptable provided there are not more than two and the length of either crack does not exceed 1/4 in. (6 mm). The *average* coating thickness shall be ~~8 9 to 13 14~~ mils (~~200 to 325~~ 225 to 350 μm) after cure. The thickness measurements shall be made in accordance with ASTM G 12. ~~The average shall be coating thickness shall be an average based on 12 individual readings with no individual reading below 9 mils (225 μm).~~ No specific correction for the base preparation process shall be applied to the thickness measurements.
- d. ~~epoxy coated reinforcing bars which will be jobsite sampled shall be accompanied by the types of certifications in the Frequency Manual and in accordance with 916.~~ Epoxy coated reinforcing bars furnished by coaters on the list of approved Certified Reinforcing Bar Epoxy Coaters shall be accompanied by the types of certifications specified in ITM 301 and in accordance with 916.
- e. repair and handling procedures shall be in accordance with 703.04. The coating material shall be in accordance with the Annex to ASTM D 3963 (D 3963M).

Epoxy coated support devices for epoxy coated reinforcing bars shall be in accordance with ASTM A 775 (A 775M), except as follows.

- a. the steel shall be in accordance with 910.01(b)1;
- b. the coating color shall contrast with the color of iron oxide;
- c. the coating thickness shall be 6 to 20 mils (150 to 500 μm) after cure. The thickness measurements shall be made in accordance with ASTM G 12.

REVISION TO 2008 STANDARD SPECIFICATIONS

SECTION 910, CONTINUED.

Other sections containing
specific cross references:

910.01(b)2

703.02 Pg 477

703.06 Pg 479

910.01(b)7

707.02 Pg 490

910.01(b)9

503.02 Pg 308

609.02 Pg 369

703.02 Pg 477

703.04 Pg 478

Recurring Special Provisions
potentially affected:

None

Motion: M

Second: M

Ayes:

Nays:

General Instructions to Field Employees

Update Required? Y___ N___

By - Addition or Revision

Frequency Manual

Update Required? Y___ N___

By - Addition or Revision

Standard Sheets potentially affected:

None

Action: Withdrawn